(k)

On the sensible qualities of the air.

of the effects + of Heat - p: 1
——— of Cold — 32

We proceed next in the order of our Syllabus to ~~point out~~ enumerate ~~enquire into~~ the various remote pre-disposing & exciting causes which induce ~~the~~ disease, by their seperate, successive, or combined action upon the human body. I shall not attempt to point out the precise action of any of them in inducing the different links in the chain of disease, inasmuch as they act so differently according to their number, force, and order and according to the different states of predispositions in the System.

~~As the Air we breath is the most fruitful source of disease, from its~~ I shall begin by taking notice of the Sources of disease from the Air. This is a most important subject, & should

V Before I enter upon this subject it will be necessary to mention the limits of what are called heat and cold as applied to the at=mosphere. In speaking of their positive effects they may be divided into hot - warm - temperate cool - and cold. Hot air exceeds 96° warm is between 96 and 75. temperate, between 75 and 65 - cool between 65 and 32. cold below 32 or the freezing point. These divisions do not apply to the relative effects of heat & cold, for we shall find ~~that~~ in the course of our inquiries that the sensation & the dis=eases of cold may be induced ~~by~~ when the mer=cury is at 80 and 72, and that ~~are~~ there are certain relative states of the system in which the air at 45° and 50° acts upon it with the equal powers of positive heat in a healthy state.

‡ I reject here the effects of artificial heat. I spoke of them formerly ~~and~~ in treating upon animal heat.

command your closest attention, inas=
=much as nearly all febrile diseases are
derived from its ~~wo~~ peculiar qualities, &
there is scarcely any other disease that is
not influenced more or less by them.

The Air induces ~~induces~~ diseases
I by its sensible qualities, in its simple
~~These are~~ or natural state.
~~heat, cold, moisture and dryness, rarity~~
~~and density~~. and
II by its insensible and extraneous qualities.

I Of the Sensible Qualities of the Air,
in its simple state.
These are Heat, Cold, Moisture, Dryness,
Rarity and Density. ~~I shall~~ I shall
first speak of the positive effects of each of them, and
~~the~~ secondly of their relative effects
upon the human body.

V I. of the positive effects of heat. The human
body is formed to exist in various degrees

~~Air and between 66 and 32, and below 32° cold can~~
~~= ding to Farenheits Thermometer.~~

The freezing point
V, may be to some ~~of~~ them, what ~~and~~ 100°: may
be to others, and
what 62°, ~~and 75 and to the be~~ to 65° are
the human body in middle life.

~~In speaking of the effects of heat therefore,~~
~~you will recollect always that I mean~~
~~the air heated about 80°.~~ -

of temperature ~~of~~ the Air, yet ~~there~~ are certain degrees of it which are most favourable to health, ~~and life~~. These degrees are different in different periods of life. From 62° to 65° ~~are most tolerable~~ are most agreeable & salutary in middle life. After the ~~age~~ 45th or 50 year of life, higher degrees of heat become necessary to health and Comfort. ~~There are the same limits in the natural & healthy effects of heat upon other animals. The above those grades which are freezing point, or may be to years of those agreeable, it~~ I need not take pains to prove in this place, that ~~Air heat to a certain degree~~ produces ~~these healthy and~~ agreeable sensations by its stimulating qualities. When ever the heat of the Atmosphere exceeds those degrees which are agreeable, it ~~as~~ produces according to its grades - elevated excitement,

debility from action, excitability - (between disorder) depression - disease, oppression - prostration and death. all these effects of ~~heat warmed bat~~ are influenced as I shall say presently by habit. I shall now mention its positive effects upon different parts of the body.

1 upon the arterial system it induces de-
-pression - excitability, and an aptitude to be affected by all the causes which produce fever. Sir Robert Wilson says ~~it~~ the intense heat in Egypt brought on a great difficulty of breathing and hemorrhages from the lungs in the soldiers of the British army in the Campaign of 17. ~~It~~ The heat in these cases was 116°: ~~warm air~~

2 ~~Heat disposes the~~ in the degrees which are stimulating beyond what is agreeable, produces excitability in the nerves inducing in them a morbid sensibility and disposing them to be acted upon by the lightest impressions. hence the frequency of Syncope & hysteria in

V ~~Affections~~ It likewise produces an indisposition to all voluntary motion.

VI Dr Pinkard takes notice of a singular effect ~~fact in the history of his~~ produced by the heat ~~severe air~~ ~~heat~~ of the West Indies with respect to sleep. He says no drowsiness ever follows it in the morning, hence to "awake" and to "rise" are one thing in that part of the world.

‡ The morbid affections thus induced by a stroke of the sun are phrenitis, mania - vertigo, apoplexy - palsy & head ach - according to the force of the sun or the predisposition of the patient.

warm seasons & countries.

3 It increases the irritability of the muscles, thereby predisposing them to tetanus and other convulsive diseases. V

4 It affects the brain with sleepiness in the ~~in~~ day time and wakefulness in the night. ~~It~~ that ~~[illegible]~~ ~~warm or hot dis~~ ~~It~~ sometimes suddenly ~~prostrates~~ affects the System by means of what is called ~~the~~ Insolation, or a stroke of the sun. This effect of ~~hot dis~~ heat is confined chiefly to Climates alternately hot and cold. In England in the year 1709 many people and even horses and oxen perished in the field from that disease. In China 11,000 persons were destroyed by it between the 14th and 25th of July ~~&~~ in the year 1743. Travellers ~~tell~~ inform us that it is unknown in ~~from the~~ in Africa ~~from Africa where the heat is uniform, in~~ ~~consequence of the Disease is unknown~~ owing to the Uniformity of the heat. ~~Affe~~

+

V 6. The Senses are affected in a peculiar manner by heat. ~~a upon a hot atmosphere~~. It ~~[illegible]~~. ~~It blunts the perception~~ first increases the sense of touch by the moisture it induces on ~~of touch~~. It disposes to Ophthalmia, Gutta Serena, and Cataract, hence the frequency in past of those diseases in Egypt. Sir Robert Wilson says it produced false vision in the soldiers in the British Army in that country. They imagined they saw Camels horses, and other Animals moving before them. It ~~do~~ weakens the Senses of taste and smell, probably by dissipating, or altering the ~~the~~ quality of the fluids ~~which~~ which covers the tongue & the membrane of the nose. It is to remedy the weakness of the sense of ~~smell~~ taste that Spices are so much resorted to in diet by the inhabitants of hot countries. It affects the sense of hearing. A Frenchman in this city lost his ear for music, and

7

5 ~~That~~ Heat affects the mind at first with Sprightliness. This is taken notice of by Dr Pinkard in his notes upon Barbadoes. It afterwards produces ~~irritable~~ irascibility, and a disposition to madness, and finally ~~a defect of~~ weakness of intellect and languor in every kind of mental exertion.

6 ~~That~~ It acts upon the Liver producing an increase in the Secretion and excretion of Bile. This has often been remarked by Butchers in the Cattle they kill in the summer Months. ~~That~~ It likewise increases the Acrimony of the bile. hence ~~we have~~ it sometimes & irritates the rectum in passing out of the bowels. The most distressing chronic diseases of warm Climates arise from excessive or vitiated bile. ~~That likewise~~ It further disposes to Inflammation, & Obstructions of the liver.

his touch for a musical Cord by a stroke of the Sun.

~~If that act upon~~

11 The same Bubos & Carbuncles do not attend the yellow fever in the West Indies only because that disease affects Europeans & Americans in whom the fluids from habit have a centripetal determination. That induces what are called freckles. These, tho suddenly induced often last for life.

8 Upon the stomach ~~a warm shot~~ heat ~~does~~ acts firstly inducing according to Dr Clark an excessive appetite, and afterwards a weakness of it more especially for Animal food. In the bowels it ~~produces~~ disposes to Colera, ~~and~~ Diarrhoea & Dysentery.

9 It ~~that~~ acts in various ways upon the Skin. By imparting to ~~to give~~ the ~~flow~~ blood a centrifugal direction it disposes to eruptions of all kinds from the bubos and carbuncles which occurs in the plague in Eastern countries down to the eczema and prickly heat which ~~apo~~ occurs in sickly seasons in the West Indies. It often covers the faces of Children with little ~~bla~~ boils in summer in the middle States of America. It produces copious discharges ~~from~~ of Sweat. These

V The quantity of perspiration discharged in warm climates is greater than in cold. ~~[illegible]~~ ~~This [illegible]~~ Women cease to menstruate from this cause in hot, ~~[illegible]~~ ~~tries~~ sooner than in cold Countries. It is from this copious ~~Determination~~ Discharge of the watery part of the blood thro' the Skin, that the Urine ~~[illegible]~~ deposits a sediment, or is increased in its quantity in the crisis of a fever in the West Indies. This is taken notice of Dr Hillary. ~~It has the that~~ In consequence ~~Upon the dis~~ of the increase of perspiration by means of heat, there is always a diminution of the Secretion of Urine ~~this is Obvious~~ in persons who enjoy good health. — It is from ~~remarkable [illegible]~~ the facility with which Nature ~~throws off morbid~~ ~~discharges~~ relieves

Discharges are sometimes cold in the East Indies. In some cases it produces an uncommon dryness upon the skin. This effect of heat generally ushers in the Hepatitis of that Country. ~~In~~ When this day this occurs in hot weather in our Country, it is ~~by~~ generally followed by ~~sickness of some kind~~ an inability to labour, ~~and~~ or by sickness of some kind. The perspiration ~~and sweats~~ sweats & discharged in summer are of a saline & acrid nature. The former may be tasted upon the backs of the hands, and it is from the acrimony acquired by the perspiration by means of heat, that catarrhs ~~contracted~~ which are induced by the perspiration thrown upon the

V Even the Urine in hot weather contracts a preternatural acrimony, so as to induce an alarming scalding when it is discharged.
Wm Taylor July 1811.

Herself by perspiration that ~~fibres~~ fibrile dis=
=eases are induced less frequently by a sudden increase of heat than of cold. It is from the greater perspiration which takes place in warm than cold countries, that gout & stone are less common ~~the~~ in the former than in the latter.

lungs by means of cold, are so much more distressing, and dangerous than Catarrhs contracted from the same cause in Winter! It is probable bowel complaints occur oftener in Summer than in Winter from obstructed perspiration, in consequence of the greater acrimony of that discharge when thrown upon the bowels. ~~Hot~~ Warm hot air discharges the white from the skin, and ~~dis~~ imparts to it ~~a dark or~~ a brown or dark color. ~~This brown or dark color is occasioned only from the heat of the sun~~. The fairer ~~of~~ the skin, the less disposed persons are to have it changed by the sun. Perhaps light, should be considered as the cause of this brown, or dark color rather than heat. It is certain the heat of a fire has no such effect,

for a particular account of the operation of all those causes in producing not only the black color of the negroes, but all the peculiarities in the structure of their bodies & the faculties of the mind, I refer you Gentlemen to Dr. Smith's inquiry into the Variety of the color & figure in the human species, and to a small tract upon the same subject by Dr Williamson of New York, in which the origin of the human race from a single pair is proved, and all the objections to it by infidel writers refuted in the most satisfactory and scientific manner. These publications do honor to the intellectual as well as to the moral character of our country. While heat in time disposes the skin to assume a black color - more time, or a succession of generations disposes it to resume its native white or flesh color. This is proved by Dr Williamson.

who are constantly exposed to it for Smiths & Cooks have as fair skins as other people. The Color of the Blacks has been ascribed to the rays of the Sun. It is certainly one of its causes, but Diet, Diseases, and a ~~peculiar~~ savage or barbarous State of Society must concur to produce it. There is no perceptible difference between the Color of White and black children in the West Indies until eight days after birth, except in the Scrotum & glans penis which at birth are of a dark color. ~~The influence of heat and bad diet~~ Heat ~~& bad diet~~ invigorates the Venereal Appetite. Hence the early marriages of females, and the late fruitfulness among males in hot climates. Count Struensee ~~[illegible]~~ who lost his life for treason against the present

This has lately been proved by Dr Osiander

Of 201 women who were delivered in a lying in hospital at Gottingen ~~Osiander~~ the Dr says

11 became pregnant in January
17 in Feb:
30 in March
17 in April
28 in May
22 in June
25 in July
16 in August
10 in Sept:
9 in Octob:
8 in Novr
8 in Decr

From this Acct we see the influence of heat upon the ~~human body in common~~ venereal appetite ~~with barren~~ for Conception took place ~~than~~ in a greater number of instances in the spring and summer months, than in the winter & Autumn in the ratio of 138 to 63.

The cases of Conception ~~Ung~~ were most numerous in March & May.

King of Denmark says in his Confessions that he had formed a design to settle in the ~~West~~ East Indies that he might enjoy in a higher degree this animal gratifi=
=cation. The effects of heat upon the Ve=
=nereal appetite in middle latitudes in
appears in the greater number of births
which occur in the Winter ~~months~~
and in consequence of Conception taking place in
than in any other season of the year
the vernal months.
Dr Boerhaave supposes from ~~these~~ facts,
that longevity is connected with cold Wea=
=ther, but if more persons have lived to
be old who were born in ~~cold~~ Winter, than
in other Seasons ~~it would be~~ I would rather ascribe
to the greater number of births in that
season, than in any other. In yielding

p. 12

It is a common thing to say the cold water acts as a sedative in these cases. But this is incorrect language. The cold water has no action. It is a nonentity - a nothing. The diminution of heat, and of the frequency of the pulse, are the effects of the abstraction of heat from the body. ~~which is~~ for heat is an entity - it is a something, it is matter, and it is a cause a stimulus. ~~As well might we say that a~~ Suppose I were to tell you that ~~I had bright~~ darkness induced the frequency of the pulse & strokes in a minute, would you believe me? - as you could not, the pulse is induced only by the absence of the ~~stimulus of~~ light - for darkness is a nonentity & a nothing; light is an entity - a something - it is matter: it is a stimulus. ~~I say, I were given you a chemical analysis of cold and darkness, and we~~

In accounting for the pain, inflammation, blisters and mortification produced by the absence of heat among other causes of them the theory of the chemists is of that the ~~extreme~~ extreme cold abstracted heat so

copiously & forcibly ~~as to abstract heat from~~
the body to the parts deprived of it and thus to produce the effects of fire
upon the frozen parts. ~~To this theory I will~~

I am aware of its difficulties & I will now
offer another. That a component part of the body is spent to its organic
Heat when in excess kills
the parts to which it applies. The effects of
this death on those parts are redness - a livid color
from living parts - is an effusion of
~~Serum~~ Serum ~~of serum~~ in the form of
blisters. ~~Cold~~ The absence of heat in excess in like manner ~~kills~~ is
followed by the torpor or death of
the parts to which it is applied, and hence
the redness, livid color and blisters which follow
it from the action of living parts upon it, ~~for~~
~~the life & death of a certain part of the~~
we see the same thing from the death of
parts of the body from all other causes. There
is a unity in their operation. We see it
in malignant or gangrenous fevers - the ~~blos~~ livor petechiæ - blisters,
upon the skin are the effects of the death or
mortification of the skin. We see it in a common
-pox blister. It is the effect of ~~the~~ the ~~skin being~~ epidermis separated by
death ~~[illegible]~~ the cutis by the Spanish flies - hence
we find ~~[illegible]~~ redness in the cutis when the blister rises.
The redness ceases only when the filaments of the

blister is not strong enough to ~~kill the part~~ destroy the life of the cutis below the cuticle. It occurs likewise after the blister has been dressed two or three times. It is inflammatory and it is necessary to the renewal of the cuticle. Mustard plasters seldom blister because they are too painful to be borne long enough to kill the parts to which they are applied. ——

~~IV. That with upon the fevers respecting~~ Seasons of

V I have only to add to this part of our subject, that the medium heat of a Country may be known by the temperature of the water under ground. Thus in Lat: 40° it is 52, and more or less in in different latitudes, In 30° = 65° and and situations. —

VI I shall first mention the Circumstances which Cause this morbid effects upon the Body, and afterwards such as encrease them.

to the influence of the Venal fire in propagating his species, man sinks for a while to a level with the lowest part of the animal creation. Fish feel its influence more than any other animals.

11. Under the positive effects of ~~heat~~ heat I shall only add that it opens the density of the solids of the body, hence a European when weighed under equal circumstances of height & bulk with a Chinese or a Hindoo is always considerably heavier. Even the bones of a person who has lived, & died in a warm climate are specifically lighter than the bones of a person who has lived and died in a cold country. V

~~Let us next inquire into the~~

~~Relative effects of Cold Heat.~~

~~Relative effects of heat without~~ heat VI

Sir John Pringle tells us that the summer of 1748 in Germany was hot, but that the British Army was very healthy and continued so until the coolness of the nights, and sleeping in wet cloaths after the battle of Dettingen produced sickness in it. He tells us further that agueish fevers are most disposed to assume a continued form in dry weather. Take notice here, the Absence of rain alone does not constitute a dry Summer, for there may be great moisture in the air from moist Winds, & these dispose to sickness though in a less degree than rain. of heat

go to p: 18

Numerous & diffusing as the diseases are which have been enumerated, ~~as they are~~ from positive heat, they are very much limited, when that heat is uniform & dry. The most healthy summer I have known in this city was that in which a dry and equable heat prevailed during the whole of that season of the year. The summer of the year 1766 in Rome in the Transactions of the Royal Society, was uncommonly dry & uniformly warm. and yet adds the writer, the city was uncommonly healthy, and all our hospitals were nearly empty!"

2 The morbid effects of heat are mitigated by time and habit. These produce at last a great degree of insensibility not only to itself, but even

go to — p: 19 A

I must add that an air totally devoid of moisture is scarcely fit for respiration. Travellers thro' the deserts of Nubia and Arabia are obliged to inhale a little moisture from a sponge in order to relieve a difficulty of breathing induced by the extreme dryness of the air. The heat of a close stove room produces the same effect, and it is only to be removed by promoting the evaporation of water by placing it in a chafing dish or a plate upon the stove. There is perhaps no such thing as air perfectly dry in any part of the world. Dr. Shaw in his travels into Syria says he found salt of Tartar to deliquesce in the hottest & driest parts of the countries he visited. It has been remarked that the diseases when they occur in warm & dry weather are less violent & malignant than those which occur in hot & wet weather. Dr. Clark says they are

[two leaves]

X The Winds from the South & S: West are sometimes so moist that Doors shut, and open with difficulty during their prevalence. ~~Doors fa~~ The moisture of these winds is so well established, that ~~we~~ there is a Silver smith in Philad^a who can tell in his work shop when they prevail from his tools losing their polish.

While I thus consider the morbid effects of heat as obviated by a dry Air V

V ~~to~~ greatest when the heat has been, not only protracted, but very intense. Acerbi tells us, that in travelling through Swedish Finland he often saw persons come suddenly out of a Vapor bath heated to nearly 200°: and stand half an hour almost naked in the open air, when the ground was covered with snow, and when the mercury was below 0, without feeling the least inconvenience from the Cold. The Russians after being exposed to their Vapor baths roll themselves in snow immediately afterwards with the same exemption from disease. - Baron Humbolt informed me ~~It is worthy of notice that the body suffers much less in passing from extreme heat to Cold than from extreme Cold to heat, all other circumstances being equal~~ that the men (300 in number) who worke in a mine near Mexico 1900 feet

A to cold. Hence we ~~for~~ observe the West Indians bear our winters for one or two years, better than our natives. It is commonly said they require those winters to cool them after being exposed for many years to a vertical fire. This insensibility to cold is will

3 ~~The Indians of hot climates~~ winds, and very much to lessen the tendency of heat to produce diseases provided they come from a Dry & healthy Country. They act by carrying off the heated air from the body, and which by stagnation becomes impregnated with the perspiration. Sailors in long Voyages in hot latitudes, become sickly in a calm, ~~perhaps~~ the air in this case undergoes a Decomposition, and this becomes a source of Disease as well as by retaining the perspiration. I shall say hereafter probably

generally ~~wild~~ Diarrhoeas, Cholera Colics & hepatitis of a mild nature. Dr Hillary says the fevers of Barbadoes are always inflamd in a hot & dry season. Dr Dalzelle says the same thing of the fevers of St Domingo. The yellow fever of Philad^a in 1793 was more obviously inflamd: than ~~any~~ most of the fevers which have succeeded it from its being accompanied with such uniform hot & dry weather. return to p. = \ 14

= below the surface of the earth in which the heat of the air is from 100° to 102°: come out of the mine in the morning & go to the right in an air in which the mercury fluctuates between 40 & 50, without taking cold, or being unpleasantly affected by it.

From these facts it is plain the body suffers much less in passing from extreme heat to cold, than from extreme cold to heat, all other circumstances being equal. —

~~But~~ A further instance of the

4 ~~Cont~~ motion lessens the morbid effects of heat. This is taken notice of by Sir Robert Wilson. It acts by promoting perspiration, by the evaporation of which from the body, there is some diminution of heat.

5 That state of the body which I called stricture, and which follows the loss of the different predispositions to disease from the expenditure of excitability, obviates in a certain degree the morbid effects of heat. Hence the ~~[illegible] effects~~ great advantage of visiting a warm climate ~~to many~~ in many chronic ~~diseases~~ disorders, & even in chronic debility. The heat here restores the excitability, or renders its absence

relative effects of heat as influenced by time & habit appears in its exciting heat in the fingers when they are thrust into warm water, and impairing the sense of touch when it acts for a long time upon the body.

~~return to p. 19. 3~~

It is from the ~~effects of heat~~ habitual effects ~~being~~ of heat that the Creoles escape the yellow fever of the West Indies which proves so fatal to Europeans & Americans. return to p: 19. 3.—

V ~~This~~ The ~~ancient Rome~~ citizens of Ancient Rome, ~~and the was~~ migrated to Naples, and the wealthy inhabitants of Portugal often migrate to the Brazils for this purpose in the evening of life.

less ~~[illegible]~~ hurtful to health & life. It is from this cause that people in the Decline of life, suffer less than middle aged people in warmer weather & in hot climates. Indeed ~~[illegible]~~ health & longevity are often obtained by ~~[illegible]~~ persons migrating from a cold, or even a temperate climate to ~~one~~ that is uniformly warm after they have passed the acme of life. 6 Abstinence, or a Diet consisting wholly of vegetables with no other Drink than water lessens the morbid effects of heat upon the body. The Brahmins we are told in ~~India~~ India under the burning Sun of India, ~~Sir Robert~~ always have cool hands. ~~While the~~ ~~Wilson remarks~~ The natives of ~~the sultry~~ ~~climates~~ of Africa ~~wear~~ have their sultry

~~& Heat acts~~ according ~~to the~~ of it is ap=
=plied to the whole, or a part of the body.
It is most apt to ~~ind~~ produce disease
in the latter way. I once saw a violent
muscular Rheumatism induced in a
young lady by sitting for some time with
her back to the fire, and I ~~saw cases~~ attended in Decem 21.
1808 ~~attending~~ a man in Hæmoptysis
brought on by sitting & working all day
with his back to a hot stove. Dr Darwin
cautions against sitting constantly with
~~the~~ the same side to the fire. ~~but it should~~ I can
easily conceive it may dispose to palsy or
other diseases. —

climates by living chiefly upon the spontaneous fruits of the earth. ~~Even the act of ea~~ Sir Robert Wilson remarks that the British soldiers in Egypt bore the heat of that country best when they abstained longest from eating, or partook sparingly of aliment. This practice by lessening stimulus, spread the cause of heat.

7 Heat acts differently upon ~~the~~ different ranks ~~and occupations~~ and professions of men. The wealthy who ~~can afford a shelter from it~~ are not obliged to work and who ~~are~~ possess the means of mitigating it by deep, cooling liquors, and shade suffer but little from it.

We come now to ~~Let us next~~ inquire into the relative circumstances which increase the morbid effects of heat upon the body. — They are

1 Previous exposure to cold. I once knew 77° of heat on the 17th of March 1791

~~[Where you see cold succeeding great heat, to produce greater morbid effects than great heat succeeding cold]~~

If of this there are many proofs in the records of medicine. Dr Sydenham says the sooner the winter sets in, and of consequence the more protracted the cold, the more malignant were the fevers especially the bad all sort of the winter & the succeeding spring. It has been = p 25

produce universal debility ~~too~~ & depression in the Citizens of Philadelphia. The same degree of heat would have been grateful and gently stimulating in the months of July and August. Pneumonies, Anginas & Rheumatism seldom fail to follow even moderate heat when it has been preceded by Cold — hence the frequency of those Diseases in the Spring and in open winters. The old saying that a green Christmas, that is a Christmas in which the ground is covered with Verdure, makes a fat Church yard in the Spring is certainly well founded. I have several times observed it in this City. The morbid effects of heat will always be proportioned to the intensity & duration of Cold. ~~If it has continued, been so intense & durable, hence it has~~

≠ Where it does not produce mortification, it excites great pain. This has often been observed in Children who ~~mark~~ apply their hands to the fire immediatly after coming out of the cold air.

Pringle has remarked that the fevers from the former cause are of a tertian type, — but from the latter — he says they are Quotidians or double tertians. Dr Clark adds further that fevers are most apt to commit in moist weather. He says the latter are of a more violent nature.

3 Heat is ~~now~~ rendered more debilitating when it is applied to the body ~~[illegible]~~ in the form of Wind. This wind which is called Sirocco is very common at Aleppo, and in some parts of Italy. It is air heated to 112° by passing over immense beds of sand. Mr. Brydone describes the effects of it at Naples, and speaks with great pity & contempt of an effeminate Italian marquis whom he met in a morning walk supporting himself under the pressure of this air by a smelling bottle.

been observed that the fevers which succeed the cold winters in Sweden & Russia are generally of a low & malignant nature. The system from the ~~by its~~ long prostration ~~of~~ parts where its excitability & tone the cold loses its power to react or to be acted upon so as to be raised to open inflammatory excitement. The effects of the sudden application of great heat to a frozen limb have often been noticed. It ~~destroys the life in the part~~ & induces mortification in the part affected.

2 Moisture combined with heat increases its morbid effects upon the Body. It does this in three ways. 1 By preventing the escape of heat from the body. Dr Hardyce found the heat of the sugar house in which he made his experiments, to be greatest when it was combined with moisture. 2 By generating cold when this moisture is applied to the body. A wet Surtout, or great Coat, and even a wet pair of Stockings Dr Dewar says often brought on ~~worst complaints~~ the Diarrhoea in the Soldiers of the British army in Egypt in 1801 by the cold produced by its evaporation. It was remarkable the small degree of cold thus produced, more certainly induced Diarrhoea than a greater degree of it, probably from the System not reacting in the former case. 3 By retaining the putrid exhalations that produce fevers longer in the atmosphere, and thereby exposing the body to a greater quantity ~~of~~ of them. Fevers from the 1st & 2nd Causes are generally of a tertian type, ~~according~~ and from the 3rd Cause of a ~~remitting nature~~ quotidian, ~~or double tertian~~ type according to Sir Jno Pringle. The last moreover are more violent, than the fevers from simple moisture.

V

The morbid effects of heat are increased by being accompanied with a dry air. This is noticed by Sydenham, Hillary, & latterly by Dr Wm Irvine in his Account of the Diseases of Sicilly. The diseases in ~~this~~ produced by this Union of ~~great heat~~ a hot & dry air are always inflammatory. This was very strikingly illustrated in the yellow fever of 1793 in this city. Fevers in hot and dry weather Sir Ph Pinckle says are generally of a con[illegible]

It even in those cases too in which heat is combined with moisture, and miasmata from exhalation.

4 Heat is rendered more certainly a remote an exciting or rapid disposing Cause of Disease from its acting upon bodies previously impreg=
=nated with ~~putrid exhalations~~ miasmata from putrefying vegetable & animal matters. Hence it is most hurtful in July & August in the Autumnal months.

5 The morbid effects of great heat are increased by its being alternated with great cold. Such is the influence of habit that the long continued action of heat upon the body defends it from many of the diseases which are produced by its early & transient applications, as in the winter, But when it is invaded by cold, this habit is destroyed, and every Summer brings with it a new or fresh Stimulus to the body. This

V. The absence of wind disposes heat to be more productive of disease. Hippocrates mentions the season which is "sine aura" as a sickly one. Calms at sea when of long continuance I hinted formerly generally produce sickness in hot weather. This was remarked in the first ships that engaged in the East India trade from England in the year 1603, particularly in a Vessel commanded by a Capt: Lancaster. It has since been taken notice of by Dr. Clark in his treatise upon the diseases of East India Voyages. I have never heard of but one exception to this remark. ~~Whilst I been~~ Baron Thoubolt informed me that in an extensive Country inhabited by several tribes of Indians at the head waters of the Osnoque & black rivers in South America, no leaf had ever been seen to be moved by a breath of wind. The Indians have not in their language a word to express wind, and yet they

turn over to 7.

explains the reason why the ~~West Indian~~ Creoles or the old settlers in the West Indies escape the yellow fever, and why the natives of the middle States in which the extremes of heat & cold prevail, are ~~affected with~~ subject to it every year.

The ~~morbid~~ effects of heat are felt in a peculiar manner by ~~a~~ very old people & by young children. I have often observed ~~a fresh hot day in~~ the extreme heat of summer to prove fatal to old people. It is most so when the nights are unusually warm. The predisposition of children to be affected by great heat is obvious from this being generally the first sufferers from it in the summer months in the middle States of America either in its simple or compound state.

All the effects of heat upon the body

~~are not more likely than persons in equal circumstances (the absence of winds excepted) in other parts of South America~~

The same degrees of heat are ~~that is~~ more hurtful ~~when the body is~~ when the heat of the body is elevated beyond its ordinary temperature by disease than they are in ordinary health. ~~Thus a heat at 90° will be more distressing~~ relative to

and Dr Winterbottom in his Synopsis says that the moist weather in England when uniform and of long continuance is not unhealthy.

doe varied by ~~thoroughly~~ its grades. The effects of moisture or dryness when combined with heat are different according to the temperature of the air. When ~~this~~ it is considerably below the heat of the body, moisture ~~it~~ seldom does any harm. Dr Hunter says the ~~wet~~ rainy seasons in Jamaica are not unhealthy when the inhabitants are not exposed to marsh exhalations. A moist and temperate air has a peculiar effect upon the skin. It imparts to it that beautiful white & red which form what is called a fine complexion. The fine complexions of the inhabitants of Great Britain & Ireland are derived chiefly from the moisture & moderate heats of those Countries. ~~The Rainy Density of the air both produce different effects according as they are more or less combined with heat & cold moisture & dryness.~~

I remark, that warm climates & countries are not necessarily unhealthy; on the contrary, that they are more favourable to health and life than middle and temperate latitudes. This has been clearly proved by General Berthier's report to the French Government, of the ~~health~~ state of the French Army in Egypt during the late Campaigns in that Country with respect to health and life. In Europe he says the number of effective sick soldiers to men is as 1 to 12 in peace & war; In Egypt in the months of Octob & Novem they were as 1 to 28 and in Novr and Decem as one to 23. In Europe he adds further, the deaths in the military hospitals were as 1 to 43 in Octob & Novem. and as 1 to 37 in Novr and Decem. If such be the state of sickness & mortality among Europeans, how much less may we not suppose it to be among the

Upon arriving the enormous morbid effects of heat upon the human body, we are led to inquire why a warm country was chosen for the birth place of the parents of the human race and why human nature has been ennobled in warm climes, than in cold climates. It was beneath the emanating sun of Egypt that the Arts and Sciences were first cultivated. The ingenious Greeks lived in a warm country; and a country in which heat greatly predominated over cold was chosen for the residence of that favoured nation through which the will and knowledge of the Supreme Being was communicated to man. To account for these facts, it is will be necessary to

Natives of that hot Country? Let us cease then to wonder that ~~a hot~~ warm climates ~~was~~ were chosen for all the purposes that have been mentioned. They came replete with blessings from the hands of the Creator, and they become unhealthy only from the indolence, ignorance & prejudices of Man in permitting filth to stagnate ~~with water~~ in their cities and country places. Plagues, Dysenteries and Opthalmies are kindly sent in order to punish the vices which permits ~~them~~ the existence ~~or~~ according to a ~~Spanish proverb~~ lying ~~occupied only by Englishmen & dogs.~~ of those diseases. nor is it in this instance only that Heaven punishes the want of Cleanliness. we see it in the Vermin, and in the instinctive abhorrence which follow the want of cleanliness in dress and person, in all the civilized parts of the world. Let it remembered 2ly that // p: 90

~~Observe that~~ Mankind are endowed with reason, and made capable of profiting by experience, and that where both are under a proper direction, they can obviate all the evils of a warm climate that have been mentioned. This has been done in part by the Natives of Africa ~~and in general healthy~~, and it was done by ~~and to wear~~ the Aborigines of the West India Islands. Even in European Countries where men live agreeably to reason, they defend themselves against ~~the~~ diseases of Summer by diet - Drinks - Shelter, Apparel & manner of sleeping ~~& cleanliness~~ accommodated to the heat of the weather. This is remarkably the case Mr Townsend tells us in Spain. ~~to day~~ The Streets of Madrid at midday ~~in the hot day~~ in Summer are deserted, or according to a Spanish proverb occupied only by Englishmen & dogs. Houses are protected from the Sun by closed doors and Windows.

Part of the day is passed in Sleep. The inha-
-bitants revive with the evening air, & open their doors and windows to receive it, and the forepart of the night is spent in Domestic or public Society. There may be other reasons why ~~the first nations~~ warm Countries have been preferred by the Author of Nature for the first nations in the world. They favour population by the facility with which subsistence is ob-
-tained. They render less labor necessary for not only the shelter & cloathing of man, ~~for food, but~~ ~~They render food, shelter and cloathing~~ ~~but~~ but for the subsistence of the Domestic Animals, which administer to his wants & pleasures, and hence they afford more time for the cultivation of the intellectual & moral & social fa-
-culties of his mind, and thereby afford him more enjoyment here, and prepare

~~V and that in two ways~~

him for greater happiness hereafter.

We come now to inquire into the morbid effects of Cold upon the human body. And here as in speaking of heat I shall first mention its positive & then its relative effects.

Cold is a negative quality. It exists only from the absence or abstraction of heat. It acts upon the human body as a sedative, that is by the abstraction of the stimulus of heat. I infer this from the debility, palness & contraction of the skin, which follows its action upon the system. Labourers & travellers in the winter season bear witness to the truth of this remark. 2ly I infer the weakness, slowness and absence of pulse which are produced by it. The pulse of a Greenlander seldom beats more than 40 strokes in a minute, and the pulses of all people are slower

V 3 From the accumulation of excitab.: by which is induced by cold when it is of a sudden or transient nature. Now stimulants we know always expend excitab.: or convert it into excitement. Take notice - I say =

V Besides abstracting heat, it acts upon the fluids of the body as it acts upon inanimate matter by contracting their bulk. This is ~~probably~~ the effect of the same cause in both kinds of matter - viz: the abstraction of ~~the~~ matter of heat.

= cold accumulates excitab.: only when it is sudden & transient - when long continued - as in Russia & Sweden, the excita= =bility is expended, hence the origin of the low fevers of those countries in the spring of the year.

in winter than in summer. Or ly from the effects of Cold ~~upon the bod~~ in certain ~~being so analogous to~~ high toned ~~the of~~ diseases being so analogous to the effects of certain medicines which are universally admitted to be sedatives, viz, bleeding, purges and low diet. ~~to~~

I am aware that another Opinion has been ~~depend~~ maintained concerning the operation of Cold, and that it is believed After Dr Cullen & some Other Physicians to act as a Stimulant upon the body. ~~John~~ As just ideas upon this subject are of great application both in pathology & in the practice of physic, I shall briefly enumerate all the arguments that have been urged in favor of the stimulating power of Cold, and endeavour to refute them!

1 It has been said that when we are much

debilitated by heat in Summer, a sudden change of the air to a cooler temperature removes that debility. The cool air is said in this case gently to stimulate, and thus to impart strength to the body. To explain this fact agreeably to the principle I am defending, it will be necessary to recollect that one of the effects of great degrees of heat is to produce depression. Let us suppose pleasant & vigorous excitement to exist between 75° & 80° of heat by Fahrenheit's Scale, - then let us suppose the heat to be increased to 90°, or above it, depression will immediately take place. In this state of the system, if cool air be applied to the body sufficient to abstract ten or fifteen degrees of heat, the body will immediately return to its healthy grade of

Pain I said formerly depends upon a tendency to disorganization or a solution of continuity from 3 Causes. 1 Distention. 2 Contraction or pressure & 3 chemical stimuli. — now the pain from Cold is the effect of ~~one of the following causes~~ or more ~~or~~ perhaps of all the following causes. 1 =

excitement, in consequence of which the depression will be removed, and the body feel a sensation which has been erroneously ascribed to a stimulating power in the Cold.

I wish you to attend to ~~this~~ the explanation ~~of the supposed stimulating~~ which has given of this fact, for it is a key that unlocks many of the Arcana of disease, and relieves us from many of the errors of Dr Brown's practice in certain diseases. - It is thus by abstracting the stimulus of blood - bile and water - ~~and indigestible food~~ & oppression, induced by ~~remedy~~ we remove debility ~~&~~ depression - in them fevers - and dropsies, and impart activity and strength to the system.

2 The pain which is induced by Cold (it is said) ~~has been said to~~ proves its stimulating power. ~~This pain depends upon one or more of these or other causes~~

V from Cold may be induced by the ~~irregularity in~~ ~~V They are enormous diversions from the~~ derangement in the ~~regular and~~ natural actions of the ~~in which~~ ~~fibres~~ parts which are the seats of pain but ~~Cases from is always the consequence~~ ~~on~~ by the Abstraction of heat, or the a certain grade of morbid excitement. = The Abstraction of blood, and light, ~~of~~ induce pain in the same indirect manner.

They leave the vessels in the state of a Ship when the wind which impels it, sudden=ly dies away. The Ship rolls from the loss of its tone, or the Equilibrium given to it by the impetus of the Wind, and thus produces new arrangements in its Cargo. Irregular ~~action~~ in every blood vessel ~~of the body~~ and fibre of the body follows ~~the~~ with the same certainty ~~unexpectedly~~ the sud=den Abstraction of such a portion of Stimulus as to destroy its tone. Bloodletting from the ~~irregular and~~ ~~and~~ irregular actions it sometimes induces (according to the state of the disease in which it is used) has been as improperly called a Stimulus as Cold. = ~~In fact of~~ ~~Cold. The pain of Cold being induced by Diffusion, we~~ ~~diseases behave with the same effect~~

contraction & ~~first is the~~ closer union of the solid parts of the body by the abstraction of their heat, in consequence of which the nerves are unduly prepared to as to emit pain.

I am aware that I formerly supposed prepare to be one of the causes of animal heat. When there is not heat emitted by the prepare or contraction of the muscles, as well as pain? I answer, the same cause according to its degree of force, often produces opposite & contrary effects. Thus a moderate stream of air thrown by a bellows upon a ~~fire coal~~ few sparks of fire inflames them, while a violent stream of air suffocates & ~~blows~~ extinguishes them. or 2. by the pain from cold may be the effect of ~~rich a~~ rapid affect of heat (which always tends to an equilibrium) to the cold part of the body as to induce the sensation in question. ~~The~~ It is certain heat & cold ~~of~~ in their extremes often produce ~~th~~ not only the same sensation, but the same morbid effects. Thus by touching frozen quicksilver a burning part blisters inflammation are induced in the fingers similar to what ~~is~~ are induced by touching red hot iron. ~~The~~ It is induced it is supposed as in the former case by the rapid affect of heat from every part of the body to the fingers. — or 3. by Pain

~~So morbid excitement takes place in the part first cold~~
~~perhaps from the sudden influx of cold blood influence in vita~~
~~by the blood first cold~~

It is no Objection to this 3 Solution of the cause of pain from cold, that the excitement of the part affected is reduced below the grade of health. The excitement in the blood vessels in a typhus fever is below their natural & healthy excitement, & yet disease and pain ~~take place in~~ occur in them. We are to distinguish between the indirect & primary effects of applications to the body and such as are indirect, & secondary. Eg: a purge is a stimulant in its first operation, but it produces sedative effects by evacuating the contents of the bowels. Thus cold is sedative in its first operation. Its stimulating effects are secondary, and accidental. Thus heat in its first operation ~~and mode in which it is~~ is often sedative that is, when it induces ~~by exciting~~ operation ~~does pain be is by exciting, but~~ & yet who will deny its being a stimulant? I take no notice here of the pain from cold which succeeds the application of heat to the body. This is evidently the effect of the stimulus of heat acting upon

2 pages

affected by cold and pain. ~~Every one~~ Either of the above causes is sufficient to account for the pain which is produced by cold, but it is probable they ~~all~~ both concur in a greater or less degree. —

3 It has been said that cold sometimes induces a redness ~~excited in the skin~~ and an apparent enlargement of the skin, analogous to the same effects of heat upon it. This is occasioned by such a ~~redness and~~ relaxation of the cutaneous vessels from a partial distortion of their capacity of life ~~ability~~ by the cold, that the blood rushes into them, and thus imparts to the skin a red color. A similar color takes place in malignant fevers & often from the same state of the capillary vessels. That the explanation I have

= ~~very~~ parts previously rendered highly irritable by the debative action of the Cold. return to 3 - p 37.